



REMARKS

Entry of the above amendments is respectfully requested. Claims 1, 2, 4 and 6 have been amended. Claims 21-23 have been added to the application. Claims 1-8, 14-16, and 18-23 are pending in the application. Claims 3, 14-16, and 18-20 are withdrawn from consideration. Favorable reconsideration and allowance of the application is respectfully requested in light of the foregoing amendments and the remarks which follow.

1. Specification Amendments

The Examiner objected to the title as not descriptive. Specifically, it appears the Examiner objected to the title because the original title referred to both a method and apparatus, whereas only method claims remain in the application after the restriction requirement. Accordingly, the Applicant has changed the title to "Method for Winding Segments of a Segmented Wound Member of an Electromechanical Device," as suggested by the Examiner.

The specification has also been amended at page 2, line 6 to correct a minor typographical error. Finally, the specification has been amended at page 3, line 1 to make clear that the disclosed segment configuration is merely exemplary.

Accordingly, withdrawal of the objection to the specification is respectfully requested.

2. Claim Rejections - 35 U.S.C. § 112, Second Paragraph

The Examiner rejected claims 1, 2, and 6 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

The claims have been amended to overcome the rejection. In claim 1, the term "the remaining sets of segments" has been replaced with "remaining ones of the sets of segments" to provide better antecedent basis.

In claim 2, the applicant believes that it was originally clear that the "winding

step" limitation of claim 2 referred to the winding step in claim 2 itself, since claim 2 further defines the winding step of claim 1. Nevertheless, claim 2 has been amended to recite "repeating the arranging step (1), the rotating step (2) and the winding step (3) for each of the remaining sets of segments." Therefore, claim 2 is now believed to be more clear.

With respect to the "plurality of segments" limitation of claim 2, the applicant respectfully submits that claim 2 is sufficiently clear. The applicant notes that claim 2 later recites "the plurality of segments forming one of the N sets of segments." Thus, the relationship between the "plurality of segments" and the previously-recited "sets of segments" is explicitly set forth in claim 2. Therefore, Applicant respectfully submits that no clarification is needed.

In claim 6, "the number of phases" and "the number of poles" and been changed to "a number of phases" and "a number of poles," thereby eliminating the antecedent basis problem noted by the Examiner.

The above changes are merely clarifying amendments and do not narrow the scope of the claims.

Accordingly, withdrawal of the rejections under 35 U.S.C. § 112, second paragraph is respectfully requested.

3. Claim Rejections - 35 U.S.C. §§ 102 and 103

The Examiner rejected claims 1, 2 and 4-6 under 35 U.S.C. § 102(b) as being anticipated by Shramo et al. ("Shramo"; U.S. Pat. No. 5,425,165). The Examiner rejected claims 2 and 4-8, alternatively, under 35 U.S.C. § 103(a) as being unpatentable over Shramo in view of Lauer ("Lauer"; U.S. Pat. No. 3,765,080).

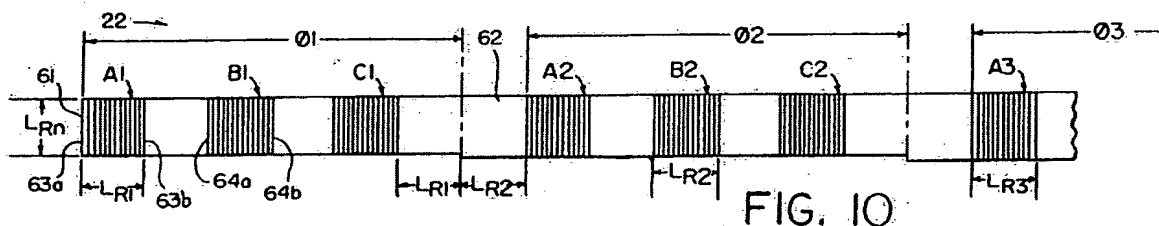
a. Allowability of Claims 1-2

Initially, the Applicant notes that the term "segment" is used slightly differently by Applicant and by the disclosure of Shramo. As used by Applicant, the term "segment" refers to a *bobbin* that is wound with wire to form a wound coil. In Shramo, the term "segment" appears to refer the *wound coil itself*. See, e.g., Shramo, col. 7, lines 17-19 ("Initially, a wire 61 suitable for use in a coil winding, such as a

small diameter insulated copper wire, is wrapped around the form 62 to establish plural coil segments, such as the three coil segments A₁, B₁, C₁.”)

To make this difference in meaning more clear in claim 1, claim 1 has been amended to recite “each segment of the N sets of segments defining a bobbin.” Claim 1 therefore now recites winding N sets of segments (bobbins) and then combining the N sets of segments (bobbins) in a common circular arrangement to form a wound member. Shramo does not teach or suggest claim 1 because Shramo does not teach or suggest these features.

The Examiner takes the position that Shramo discloses winding segments in FIG. 10. For convenience, FIG. 10 of Shramo is reproduced below:



In Shramo, wire is wound around a wiring form 62 to form coil segments A₁, B₁ and C₁. The three coil segments A₁, B₁ and C₁ are collectively used to form Phase 1 (Ø1) of a coil winding 22. Phase 2 and Phase 3 are also formed in the same manner. The coil winding 22 is then *removed from the wiring form 62* before being wrapped around a cylindrical core 66 as shown in FIG. 12. (Col. 9, lines 2-6; Col. 9, lines 35-36.) Therefore, the form 62 is not placed into a circular arrangement to form a wound member of the motor 10.

Therefore, Shramo does not teach or suggest winding N sets of segments (each of the coil segments defining a bobbin) and then combining the N sets of segments (bobbins) in a common circular arrangement to form a wound member. The coil segments A_n, B_n and C_n do not meet these limitations because the coil segments A_n, B_n and C_n do not define bobbins. The wiring form 62 does not meet these limitations because the wiring form is not placed in a circular arrangement and is not used to form

a wound member of the motor 10.

Accordingly, claim 1 is believed to be allowable. Claim 2 depends from claim 1 and is believed to be allowable for at least the reasons that claim 1 is allowable. Accordingly allowance of claims 1 and 2 is respectfully requested.

b. Allowability of Claims 4-8

Claim 4 has been amended to make clear that the term "segment" refers to a bobbin. Shramo does not teach or suggest claim 4 because Shramo does not teach or suggest "arranging a plurality of segments in a side-by-side orientation along an axis of rotation, each segment of the plurality of segments defining a bobbin" and "combining the plurality of segments in a circular arrangement to form the wound member." The coil segments A_n , B_n and C_n in Schramo do not meet these limitations because the coil segments A_n , B_n and C_n do not define bobbins. The wiring form 62 does not meet these limitations because the wiring form is not placed in a circular arrangement and is not used to form a wound member of the motor 10.

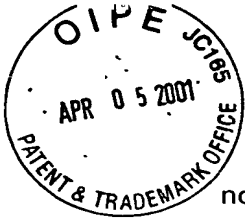
With respect to Lauer, the Examiner cites Lauer for teaching the step of rotating the segments and a wire dispenser relative to each other. The Examiner does not appear to contend that Lauer discloses the arranging or combining steps. The Applicant respectfully submits that Lauer does not teach or suggest "arranging a plurality of segments in a side-by-side orientation along an axis of rotation, each segment of the plurality of segments defining a bobbin" and "combining the plurality of segments in a circular arrangement to form the wound member."

Accordingly, claim 4 is believed to be allowable. Claims 5-8 depend from claim 4 and are believed to be allowable for at least the reasons that claim 4 is allowable. Accordingly allowance of claims 4-8 is respectfully requested.

4. New Claims 21-23

The applicant has added new dependent claims 21 and 22 to the application and new independent claim 23 to the application.

New dependent claims 21 and 22 are believed to be allowable for the same reasons that their respective base claims are allowable, and for reciting other



novel and non-obvious features. New independent claim 23, like claim 1, recites "winding N sets of segments, each segment of the N sets of segments defining a bobbin" and "combining the N sets of segments in a common circular arrangement to form the wound member." Therefore, new independent claim 23 is believed to be allowable for generally the same reasons that claim 1 is believed to be allowable.

Accordingly, allowance of new claims 21-23 is respectfully requested.

5. Conclusion

In view of the foregoing amendments and remarks, favorable reconsideration and allowance of the application is respectfully requested. Should the Examiner have any remaining questions, the Examiner is invited to contact the undersigned at the telephone number appearing below.

The Assistant Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.116-1.17, or credit any overpayment, to Deposit Account No. 01-0857.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

- ***Marked up version of first full paragraph substituted on page 2:***

Various techniques are known for constructing a stator of an electric motor. For example, according to one known technique, the stator is constructed using a large number of very thin laminations that, when stacked together, produce a stator structure that is generally cylindrically shaped [with] but with bobbin structures that extend the length of the cylinder and that protrude radially inwardly. The bobbins are then each wound with wire to form respective stator coils using a needle-based winding machine that is placed at the center of the stator structure.

- ***Marked up version of third full paragraph substituted on page 2:***

A recognized solution to this problem is to utilize what is referred to in the art as a segmented stator. According to this approach, the stator is constructed using a plurality of segments each of which defines a bobbin upon which wire is wound to form one of the coils of the motor. Typically, each [Each] segment is generally T-shaped when viewed from one end of the motor, with the bottom (vertical) leg of the T forming the bobbin upon which wire is wound to form one of the coils of the motor, and the top (horizontal) leg of the T being joined end to end with the top legs of the other T-shaped segments in the shape of a circle, thereby resulting in a circular stator when viewed from one end of the motor. This construction technique therefore results in a stator with an overall shape that is the same as that of an unsegmented stator.

- ***Marked up rewritten claims:***

- 1 1. (Once Amended) A method of constructing a segmented wound
2 member of an N phase electromechanical device, comprising:
3 (A) winding N sets of segments, each segment of the N sets of
4 segments defining a bobbin, the N sets of segments being
5 wound with a single continuous length of wire for each set;
6 and
7 (B) combining the N sets of segments in a common circular
8 arrangement to form the wound member; and



wherein each of the N sets of segments is wound separately from [the]
10 remaining ones of the sets of segments and then combined in the common circular
11 arrangement with the remaining ones of the sets of segments to form the wound
12 member.

1 2. (Once Amended) A method according to claim 1, wherein the
2 winding step includes
3 (1) arranging a plurality of segments in a side-by-side orientation
4 along an axis of rotation, the plurality of segments forming one
5 of the N sets of segments;
6 (2) rotating the plurality of segments and a wire dispenser relative
7 to each other about the axis of rotation;
8 (3) winding the plurality of segments during the relative rotation
9 of the plurality of segments and the wire dispenser; and
10 (4) repeating the arranging step (1), the rotating step (2) and the
11 winding step[s] (3) for each of the remaining sets of segments.

1 4. (Once Amended) A method of winding segments of a segmented
2 wound member of an electromechanical device, comprising:
3 (A) arranging a plurality of segments in a side-by-side orientation
4 along an axis of rotation, each segment of the plurality of
5 segments defining a bobbin;
6 (B) rotating the plurality of segments and a wire dispenser relative
7 to each other about the axis of rotation; [and]
8 (C) winding the plurality of segments during the relative rotation
9 of the plurality of segments and the wire dispenser; and
10 (D) combining the plurality of segments in a circular arrangement
11 to form the wound member.

1 6. (Once Amended) A method according to claim 4,
2 wherein the arranging, rotating, [and winding steps] winding and combining
3 steps are performed N times, N being equal to [the] a number of phases of the
4 electromechanical device,
5 wherein a total of N sets of M segments are wound for the
6 electromechanical device, M being determined by [the] a number of poles of the



7 electromechanical device and being equal to the number of segments that are
8 arranged, rotated, [and] wound, and combined during each performance of the
9 arranging, rotating, [and] winding, and combining steps, and
10 wherein the N sets of M segments are combined into a common circular
11 arrangement.